XVII. *A Letter from Monſieur* Wargentin, *Secretary to the Royal Academy of Sciences in* Sweden, *to Mr.* John Ellicott, *F. R. S. relating to the late Tranſit of* Venus.

Stockholm, December 24, 1762.

Read March 17, 1763. THE obſervations upon the laſt tranſit of Venus over the Sun made at the Cape of Good Hope are excellent, and ſeem to decide, that the horizontal parallax of the Sun is 8″, 1 or 8″, 3 at moſt. I had before found it to be that quantity, from the obſervations made in Europe compared together; but the obſervations made at the Cape confirm it with the greateſt evidence.

It is of importance to be aſſured of the longitude of the places where the obſervations were made. I have endeavoured to determine them the beſt I was able by obſervations of the eclipſes of Jupiter's ſatellites, made at the ſame places. That you may the better judge, I thought proper to ſend you all the obſervations of theſe ſatellites made at different places the laſt year. I deſire you would communicate them to Mr. Maſon, and all thoſe who intereſt themſelves in the reſearch of the parallax. It is pity that meſſieurs L'Abbè Chappe, and Rumoſki, did not ſucceed in obſerving ſeveral eclipſes of the ſatellites, at Tobieſke and Selenginſk, the better to confirm the Longitudes of thoſe places. However it appears to me, that the difference between the meridians of

Greenwich and Tobieſké is ſcarcely more than $4^h\ 32'\ 55''$. That between the meridians of Greenwich and Selenginſk, to judge from the three immerſions obſerved there, ſhould be but $7^h\ 6'\ 0$, but from other conſiderations, I think it muſt be 10 or $15'$ more. If the longitude of theſe places ſhould be more exactly determined, I am perſuaded that we ſhould obtain the parallax of the Sun to nearly the tenth of a ſecond, ſo exact the obſervations made at Selenginſk and Tobieſkè and the Cape appear to me.

I ſee you did not communicate to the Royal Society all the obſervations made by Mr. Planman at Cajaneberg, they however deſerve to be preſerved. He obſerved

	h	′	″
The beginning of the entrance - - at	3	59	56M
Total immerſion of Venus or interior contact - - - - - - - - - - —	4	18	5
Second interior contact or beginning of the exit - - - - - - - - - - —	10	7	59
Total emerſion - - - - - - - - - - —	10	26	22

Mr. Planman made uſe of a teleſcope of 20 or 21 feet; the latitude of Cajanebourg is $64°\ 13'\ 30''$; the difference of meridians between Greenwich and Cajaneburg is ſufficiently determined by obſervations upon the eclipſe of the Moon the 18th May 1761, made at Stockholm and Cajaneburg.

I have the honour to be with the greateſt eſteem,

SIR,

Your very humble and obedient ſervant,

P. Wargentin.

Eclipſes primi ſatellitis Jovis, obſervatæ Anno 1761: addito errore calculi pro quavis obſervatione, ut appareat, quæ ſint præſtantiores. In calculo autem poſui differentiam meridianorum inter

		h	′	″
Obſervatorium Grenovic. et Pariſ.	—	0	9	10
Grenov. et Stockholm	—	1	12	0
Grenov. et Upſalienſe	—	1	10	20
Grenov. et Maſſil.	—	0	21	19
Grenov. et Cap. B. Spei	—	1	13	35
Grenov. et Inſul. Rodrig	-	4	12	52
Grenov. et Selenginſk	—	7	6	15
Grenov. et Cajaneburgh	-	1	50	40

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		h	′	″			′	″
Jan. 7.	Em.	5	4	35	Stockholmiæ	+	0	27
June 13.	Im.	14	37	47	Maſſiliæ - - -	—	0	21*
20.	—	17	22	26	Cap. Bonæ Spei	+	0	31
July 22.	—	12	45	15	Paris - - - -	+	0	7
		12	35	39	Grenov. - - -	+	0	33
		16	48	55	Inſ. Rodriga -	+	0	9
29.	—	14	38	35	Paris - - - -	+	0	33
		14	50	28	Maſſiliæ - - -	+	0	49
		15	42	44	Cap. B. Spei -	+	0	49
31.	—	13	10	29	Inſ. Rodrig. -	+	0	56*
Aug. 7.	—	10	51	52	Grenovic. - -	+	1	8*
		12	4	51	Stockholm. bona	+	0	9
		11	13	49	Maſſiliæ - - -	+	0	30
		12	5	46	Cap. B. Spei -	+	0	49
14.	—	13	59	39	Stockholm. certa.	+	0	10
		14	0	50	Cap. B. Sp. -	+	0	34

	h	′	″		′	″
Aug. 21. Im.	14	51	56	Paris - - - -	+ 0	34
	15	56	2	Cap. B. Spei -	+ 0	53
23. —	9	20	49	Paris - - - -	+ 0	40
	10	22	42	Upſaliæ - - -	— 0	3*
	10	25	10	Cap. B. Spei -	+ 0	44
25. —	10	46	24	Selenginſk - -	+ 1	6*
28. —	16	48	41	Paris - - - -	— 0	12*
30. —	11	7	58	Grenovici - -	+ 0	27
	12	17	43	Upſaliæ - - -	+ 1	2*
	12	21	32	Cap. B. Spei -	+ 0	28
	12	58	50	Cajaneburgi -	+ 0	15
Sept. 1. —	9	49	40	Inſ. Rodrig. -	+ 0	40
8. —	7	55	37	Maſſiliæ - - -	— 0	17*
	9	23	40	Cajaneburgi -	+ 1	1*
15. —	9	39	55	Paris - - - - -	+ 0	5
24. Em.	8	7	46	Grenovici - -	+ 1	1
	8	29	11	Maſſiliæ - - -	+ 0	55
	9	21	35	Cap. B. Spei -	+ 0	47
Oct. 1. —	10	13	56	Paris - - - -	+ 0	59
10. —	6	40	8	Paris - - - -	+ 0	45
17. —	8	36	38	Paris - - - -	+ 0	46
Nov. 9. —	8	51	19	Paris - - - -	+ 1	48*
16. —	10	46	26	Paris - - - -	+ 1	6
18. —	5	27	40	Maſſiliæ - - -	+ 0	32*
Dec. 2. —	10	5	4	Stockholmiæ -	+ 0	32*
4. —	4	33	8	Stockholmiæ -	+ 0	39
11. —	6	25	44	Stockholmiæ -	+ 0	43

Obſervationes ſecundi ſatellitis, eodem anno habitæ.

	h	′	″			′	″	
June 11. Im.	14	51	24	Cap. B. Spei	+	0	14	
18. —	17	27	11	Cap. B. Spei	+	0	4	
July 13. —	13	28	53	Paris	+	0	9	
20. —	16	5	1	Paris	+	0	35	
	15	54	28	Grenovici	+	1	58	*
	17	9	42	Caput B. Spei	+	0	19	
31. —	14	57	17	Selenginſk	+	1	41	*
Aug. 7. —	10	30	9	Grenovici	+	0	59	
	11	43	1	Stockh. optima	+	0	7	
	11	43	26	Cap. B. Spei	+	1	17	*
14. —	14	21	37	Stockh. certa	+	0	17	
	13	18	39	Paris	+	0	25	
25. —	12	15	4	Selenginſk	+	0	9	
Sept. 1. —	9	1	6	Stockh. certa	—	0	5	
	9	2	20	Cap. B. Spei	+	0	16	
	8	59	19	Upſaliæ	+	1	2	*
8. —	10	37	59	Pariſiis	+	0	26	
	10	29	30	Grenovici	—	0	5	
	10	50	40	Maſſiliæ	—	0	6	
	11	42	20	Cap. B. Spei.	+	0	30	
15. —	13	6	36	Grenovici	+	3	12	*
Oct. 28. Em.	8	9	51	Maſſiliæ	—	0	7	
Nov. 11. —	13	12	43	Paris	—	0	2	
22. —	5	18	12	Maſſiliæ	+	0	49	
	6	9	24	Stockh. dub.	+	0	16	*
Dec. 6. —	10	15	59	Paris	+	0	46	

Eclipſes tertii ſatellitis Jovis, obſervatæ anno 1761.

		h	′	″			′	″
Maj. 11.	Im.	15	19	3	Paris - - - - -	—	3	30
Jun. 16.	Em.	15	26	32	Cap. B. Spei	—	2	21*
23.	Im.	15	20	6	Paris - - - - -	—	5	20
		15	32	20	Maſſiliæ - - - -	—	5	25
		15	10	24	Grenovici - - -	—	4	48
Jul. 29.	—	11	18	49	Paris - - - - - -	—	4	10*
		12	23	23	Stockh. certa -	—	5	54
		12	24	0	Cap. B. Spei	—	5	8
	Em.	15	17	13	Cap. B. Spei	+	0	23
		15	15	22	Stockh. certa -	+	0	51
Aug. 5.	Im.	15	34	51	Paris - - - - -	—	6	18
Sept. 3.	—	8	36	36	Cap. B. Spei -	—	5	25
		9	13	39	Cajaneburg - -	—	5	4
10.	—	11	27	6	Grenovici - - -	—	4	53
		11	49	9	Maſſiliæ - - -	—	5	37
Nov. 21.	Em.	6	41	9	Paris - - - - -	+	0	15
		6	52	44	Maſſiliæ - - -	+	0	51
28.	Im.	8	10	29	Paris - - - - -	—	5	24
		8	23	31	Maſſiliæ - - -	—	6	18
		9	14	22	Stockh. optima	—	6	28
	Em.	10	40	57	Paris - - - - -	—	0	16
		10	52	55	Maſſiliæ - - -	—	0	6
		11	44	34	Stockh. dub. -	—	1	4*

Eclipſes quarti ſatellitis, obſervatæ Anno 1761.

	h	′	″		′	″
Aug. 10. Im.	14	25	15	Pariſiis - - - -	+ 2	18
	15	32	57	Cap. bonæ Spei	— 0	59
27. —	8	41	40	Grenovici - -	— 0	21
	9	2	3	Maſſiliæ - - -	+ 0	35
	9	53	32	Cap. B. Spei -	+ 1	22
	9	50	18	Upſaliæ - - -	+ 1	21
	10	16	23	Tornæ - - - -	+ 1	34
Em.	11	47	41	Paris - - - -	+ 3	10
	12	1	52	Maſſiliæ - - -	+ 1	8*
	12	49	0	Cap. B. Spei. -	+ 6	16
	12	48	7	Upſaliæ - - -	+ 3	54
	12	47	31	Stockh. certa -	+ 6	10
	13	15	13	Tornæ - - - -	+ 3	6
Nov. 2. Im.	10	51	47	Maſſiliæ - - -	+ 5	50
Em.	12	57	37	Maſſiliæ - - -	+ 7	44
19. Im.	6	6	34	Stockh. tub. max.	— 8	51
	6	2	30	Ibid. tub. minore	— 4	47
	4	57	16	Paris - - - - -	— 2	23
Em.	6	56	29	Paris - - - - -	+ 6	32

Obſervationes aſteriſco * notatæ, minus certas ſuſpicor. Differentiæ inter reliquas tribuendæ videntur differentiis teleſcopiorum, majori minorive aëris ſerenitati, et fortaſſis cuidam incertitudini circa differentias meridianorum.

Obſervationes Stockholmenſes habitæ ſunt teleſcopio novo Dollondiano 10 ped. objecta 120^es ſecundum diametros amplificante.